

Hybrid Vehicle Evaluation Code

Computer model evaluates performance of next-generation vehicles

LNL is using its experience in computer code development, cost/benefit and decision analysis, and testing to develop a hybrid vehicle evaluation code. The model can be used to simulate a variety of vehicle types and components. The code can predict fuel economy and emissions for the Environmental Protection Agency (EPA) Urban and Highway driving schedules, as well as hill climbing ability and acceleration times.

APPLICATIONS

- Battery electric vehicles
- Flywheel vehicles
- Battery-flywheel hybrid vehicles
- Engine-generator-flywheel vehicles
- Engine-generator-battery hybrid vehicles
- Fuel cell-flywheel hybrid vehicles
- Fuel cell-battery hybrid vehicles
- Fuel cell vehicles

Vehicle performance modeling

The model can simulate pure electric or series hybrid vehicles. In a series hybrid vehicle, the chemical energy of the fuel is first converted to electrical energy. The electrical energy is then either stored or transferred as needed to the electric drive motor. Different engine-generator units or fuel cells can be specified for generating electricity from various fuels. Batteries, flywheels, or ultracapacitors can be specified to store the electrical energy. An electric propulsion motor can be

selected from the different types available.

Experimental components can also be incorporated to the code if an engineering model is supplied.

Integrated analysis

The code estimates weight and volume for power train components, mileage on the EPA Federal Urban and Highway Driving Cycles, acceleration and hill climbing performance, and emissions. The code includes regenerative braking and is useful for sensitivity analysis on components performance.

The code has been applied to many vehicles, including electric vehicle prototypes, a hydrogen concept car, electric buses, hybrid trains, and a natural gas vehicle. The code has also been used to optimize vehicles for high fuel economy and low emissions.

Availability: The hybrid vehicle evaluation code is fully operational. Please notice that the code has not been documented properly, and will not be given out. However, with appropriate funding, we will run the code for a partner.

Contact

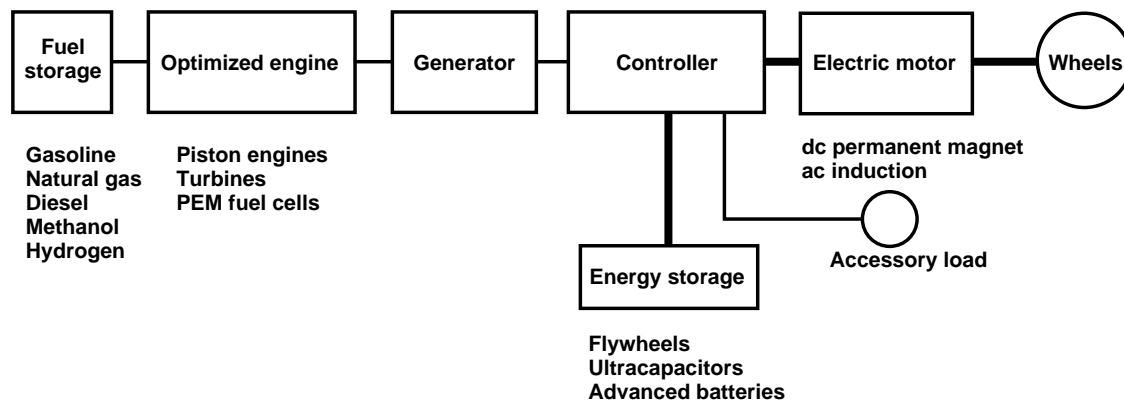
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Schematic of a series hybrid vehicle and component choices.